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09/683,482	01/07/2002	Jia-Fan Wong	ADTP0028USA	2814

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EXAMINER

RUDE, TIMOTHY L.

ART UNIT PAPER NUMBER

2871

DATE MAILED: 10/21/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/683,482

Applicant(s)

WONG, JIA-FAM

Examiner

Timothy L Rude

Art Unit

2871

-- Th MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 August 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2 and 4-11 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2 and 4-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other.

DETAILED ACTION

Claims

1. Claims 1 and 4-10 are amended. Claim 3 is canceled.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuyama et al (Matsuyama) USPAT 6,469,765 in view of Sato USPAT 6,160,601.

As to claims 1, 3 and 4, Matsuyama discloses in Figures 9 and 10, third embodiment (col. 21, line 36 through col. 22, line 55), a liquid crystal display (LCD) comprising: a first substrate, 900, comprising a first surface; a second substrate, 800, comprising a second surface, the second surface being in parallel with and opposite to the first surface of the first substrate, and a pixel area being defined on the second surface; a second common electrode, 500 (Applicant's first electrode), positioned on the first surface of the first substrate; a first common electrode, 410 (Applicant's second electrode), disposed above the pixel region of the second substrate, the second electrode having side opening portions, 416 (Applicant's first slit) elongated along a first

direction; an isolation layer, 812, disposed on the surface of the second substrate to cover the second electrode; a pixel electrode, 300 (Applicant's third electrode), disposed on the isolation layer and within the pixel region, opening portions, 304 (Applicant's second slit), being defined on the third electrode and along the first direction, the first and second slits being interlaced (per Figures 9 and 10); and a plurality of anisotropic liquid crystal molecules with negative dielectric constant (Abstract) positioned between the first electrode and the third electrode, the longitudinal axis of the liquid crystal molecules being positioned along a second direction horizontally (Figure 3 and col. 21, lines 42-45), and a first angle being formed between the first direction and the second direction; wherein a biased electric field is formed as a voltage is applied between the first electrode and the second electrode, such that (a) a first horizontal biased electric field is formed in the neighborhood of the second slit (Figure 4), the first horizontal biased electric field is perpendicular to the first direction, and the liquid crystal molecules are rotated to make the longitudinal axis of the liquid crystal molecules in the neighborhood of the second slit being in parallel to the first direction, (b) the longitudinal axis of the liquid crystal molecules in the neighborhood of the first electrode maintain along the second direction because no horizontal biased electrical field is formed near the first electrode, and (c) the liquid crystal molecules between the first electrode and the second slit of the third electrode gradually rotate from the second direction to the first direction,

FIG. 9

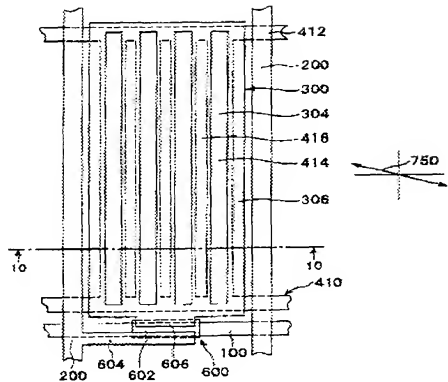
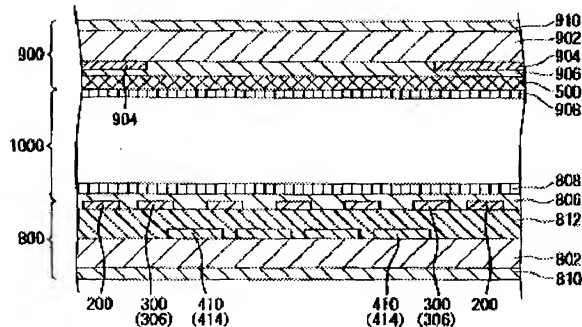


FIG. 10



wherein the second electrode, 410, is a transparent common electrode (Applicant's pixel electrode) (col. 15, lines 14-17 and col. 21, lines 42-45) and wherein the third electrode, 300, is a transparent pixel electrode (Applicant's second common electrode).

However, Matsuyama does not explicitly disclose a display wherein the second electrode, 410, is a pixel electrode and wherein the third electrode, 300, is a lower common electrode.

Sato teaches in his first embodiment (Figures 7 and 8) a TFT substrate that has the pixel electrode above the common electrode with a bottom gate TFT (col. 8, lines 63-65) is functionally equivalent (col. 12, lines 7-11) to his second embodiment (Figures 10 and 11) a TFT substrate that has the common electrode above the pixel electrode with a top gate TFT (col. 11, lines 59-61). Furthermore, reversal of parts is considered an obvious expedient, MPEP 2144.04, VI, A.

Sato is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to use a pixel electrode below a common electrode as an art recognized equivalent, MPEP 2144.06.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Matsuyama with the art recognized equivalent of Sato.

As to claim 2, Matsuyama discloses the liquid crystal display of claim 1, further comprising a first polarizer, 910, positioned above the first substrate, and a second polarizer, 810, positioned below the second substrate (col. 14, lines 58-65 and col. 21, lines 42-45).

As to claim 5, the recitations of: wherein the biased electric field formed between the pixel electrode and the second common electrode is used to accelerate the rotation of the liquid crystal molecules so as to reduce a driving voltage of the liquid crystal display, is an intended use and/or performance recitation in a device claim that is considered inherently met by the structure of Matsuyama in view of Sato.

As to claim 6, the recitations of: wherein the isolation layer is used to isolate the pixel electrode from the second common electrode and avoid a short circuit between the pixel electrode and the second common electrode, is an intended use and/or performance recitation in a device claim that is considered inherently met by the structure of Matsuyama in view of Sato.

3. Claims 7-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuyama in view of Sato, as applied to claims 1-6, and further in view of Tani USPAT 6,392,735.

As to claims 7, 8, and 11, Matsuyama in view of Sato discloses the liquid crystal display of claim 1.

Matsuyama in view of Sato does not explicitly disclose the use of a conductive protrusion.

Tani teaches as prior art the use of a conductive columnar spacer (Applicant's protrusion) projected from the first surface of the first substrate, the protrusion being

electrically connecting the counter electrode (Applicant's first electrode) with the auxiliary line so that the first electrode and the auxiliary line are held at substantially equal voltage. Since the voltage is applied from a large number of locations to the counter electrode, the resistance between the auxiliary line and the counter electrode is so small that the voltage at the counter electrode can be surely maintained at a predetermined value (Applicant's reduce signal delay). Also, since no stress is generated, irregular display may not occur, thus improving the display quality. Further, the data bus lines and the scan bus lines may not be disconnected (col. 1, lines 40-57).

Tani is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add conductive protrusions to electrically connect a first electrode on a first substrate to conductive elements of like potential on the opposed substrate so the counter electrode can be surely maintained at a predetermined value, so, an irregular display may not occur, thus improving the display quality.

Therefore, it would have been obvious to one having ordinary skill in the art of liquid crystals at the time the invention was made to modify the LCD of Matsuyama in view of Sato with the conductive protrusions of Tani to electrically connect a first electrode on a first substrate to a third electrode of like potential on the opposed substrate so the counter electrode can be surely maintained at a predetermined value so, an irregular display may not occur, thus improving the display quality.

As to claim 9, Matsuyama discloses a display wherein the third electrode has a width, and the width is reduced by opening portions, 304 (Applicant's second slit), so as to increase an aperture ratio of the display.

As to claim 10, the recitations of: wherein static charges formed on the first electrode are released through the protrusion after the first electrode is connected to the third electrode, is a performance recitation in a device claim that is considered inherently met by the structure of Matsuyama in view of Sato and further in view of Tani.

Response to Arguments

4. Applicant's arguments filed on 18 August 2003 have been fully considered but they are not persuasive.

Applicant's ONLY arguments are as follows:

(1) Regarding claims 1, 2, 5, and 6, the instant Application is absolutely different in that *inter alia* the pixel electrode is on the top surface of the bottom substrate in contrast to the Matsuyama pixel electrode on the isolation layer that is in-turn on the first common electrode.

(2) Regarding claims 1, 2, 5, and 6, Matsuyama never teaches how to avoid short-circuiting.

(3) Regarding claims 3 and 4, a display with a pixel electrode above the common electrode can never produce the same electric field as a display with the common electrode above the pixel electrode.

(4) Regarding claims 7-11, Tani does not teach the use of conductive protrusions extensively and evenly.

Examiner's responses to Applicant's ONLY arguments are as follows:

(1) It is respectfully pointed out that Applicant did not claim a pixel electrode in claims 1, 2, 5, and 6; Applicant broadly claims a second electrode.

(2) It is respectfully pointed out that Matsuyama discloses the claimed structure, and does not need to teach all beneficial effects inherent to said structure.

(3) It is respectfully pointed out that Sato teaches that electrodes may be reversed in a display. Also, liquid crystal displays often use alternating current, so the electric field produced is likewise alternating. Sato is evidence that reversing or interchanging the pixel electrode and the lower common electrode would have been obvious to those having ordinary skill in the art of liquid crystals at the time the claimed invention was made as an art-recognized species suitable for the intended purpose of comprising switching electrodes (MPEP 2144.07). Also, Applicant cites differences in field patterns that would have been obviously expected to those of ordinary skill in the art. Examiner does not see in the Specification or the Arguments any unexpected results obtained by the claimed invention.

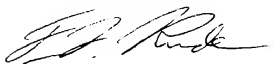
(4) It is respectfully pointed out that Tani is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add conductive protrusions to electrically connect a first electrode on a first substrate to conductive elements of like potential on the opposed substrate so the counter electrode can be surely maintained at a predetermined value, so, an irregular display may not occur, thus improving the display quality, per rejection above. Examiner maintains the teaching of Tani would have rendered Applicant's claimed invention obvious those having ordinary skill in the art of liquid crystals at the time the claimed invention was made. Additionally, It is respectfully pointed out that Applicant did not claim the use of conductive protrusions extensively and evenly in claims 7-11; Applicant broadly claims a protrusion.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Timothy L Rude whose telephone number is (703) 305-0418. The examiner can normally be reached on Monday through Thursday.

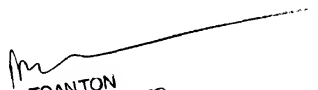
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.



Timothy L Rude
Examiner
Art Unit 2871

TLR
October 14, 2003



TOANTON
PRIMARY EXAMINER